



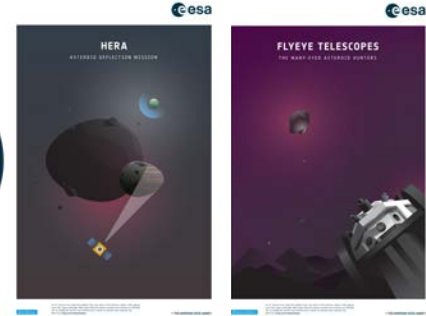
Agenzia
Spaziale
Italiana

ASI activities on Near-Earth Objects

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International Cooperation and Committees

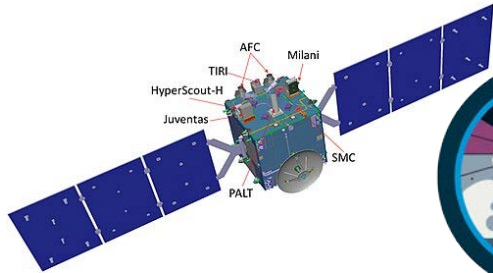
- ❑ International Asteroid Warning Network (IAWN)
- ❑ Space Mission Planning Advisory Group (SMPAG)
 - ❑ Hypothetical Near-Earth Asteroid impact exercise
- ❑ European Space Agency (ESA) Space Safety Programme
 - Planetary Defense space missions (Hera , Ramses)
 - Flyeye telescope devoted to NEOs discovery
 - ESA NEO Coordination Center Operations (ESRIN, Italy)
- ❑ European Union Space Situational Awareness Programme



Space Missions to NEOs

ASI contribution to ESA Planetary Defence Missions Hera and RAMSES

- ❑ Italy contributed to the development of the **Milani CubeSat**, a nanosatellite onboard Hera for detailed close-up observations.
- ❑ Italian science community is largely involved in the Hera **Investigation Team** and **Science Operations**, leading Radio Science and VISTA instruments.
- ❑ Italy is funding the development of **HAMLET**, an hyperspectral camera, which is essential for RAMSES's taxonomic and exploration requirements.
- ❑ Italy is leading HAMLET, VISTA, HORUS instruments, and the Radio Science Experiment, onboard RAMSES.
- ❑ ASI supports the extensive participation of the Italian science community across all RAMSES Working Groups.



ASI Space Missions to NEOs

In the frame of the ASI project **ALCOR** for nano-satellites ASI is funding the 12U CubeSat **ANIME**: Asteroid Nodal Intersection Multiple Encounters.

Goal: Explore three near-Earth asteroids (NEAs) of huge interest in terms of both planetary science and defence, two flybys with PHAs and a rendezvous target 2000 SG344

Mission Status: Phase B, Expected launch date Q3 2029

The **NIVES** (Near-Earth Interplanetary Voyage for asteroid **Exploration and Survey**) and **AEGIS** (Asteroid **Exploration mission for Geophysical Investigation and in-Situ analysis**) projects represent a strategic Italian effort to advance robotic exploration of NEAs, developing mission concepts for In-Situ Resource Utilization (ISRU) and asteroid mining.

Goal: Develop capabilities for complex interplanetary voyages, autonomous proximity operations, and demonstrating the technical feasibility of landing, accessing the subsurface, and performing in-situ measurements on the asteroid's surface.

Mission Status: Completed Phase A



Ground-based observations for NEOs

ESA Flyeye telescope network for NEO discovery

The Flyeye is a new generation wide-field high-sensitivity 1-m class telescope dedicated to NEO discovery.

ASI is the first contributor to the ESA Flyeye initiative under the Planetary Defence topic of the Space Safety Programme.

- ❑ **Flyeye-1** has been temporarily deployed at the **ASI Matera Space Center**
- ❑ Final location will be on **Mt. Mufara (Sicily)**
- ❑ **Flyeye-2** will be deployed in southern hemisphere by 2028



Observation Tools and Services

Orbit determination and impact monitoring

ASI has undertaken the transition in-house of the **NEODyS** service for the orbital determination and impact monitoring of NEOs



MonAster (Asteroid Monitoring) is an Research and Development Project

Goal:

- ❑ new algorithms for orbital determination, new astrometric error models, new methods for orbit propagation, proper elements calculation, age estimation, analysis of the Yarkovsky effect on long-term monitoring



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ASI works to strengthen international collaboration and develop new generation observational capabilities to mitigate the risk that NEOs can pose to human life and economy.



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Thank you for your attention

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